

Improvement of marl and dune sand for highway construction in arid areas

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Abstract: Major parts of the Eastern Province of Saudi Arabia are covered with windblown dune sand which is characterized as poorly-graded soil with high permeability. Also, marl, which is available in abundance in this region, has poor strength. It is usually required to use these materials as subgrade layers or as a backfill in base and subbase layers of roads and highways. Because of the low strength characteristics of these materials and the high water table in the region, some sort of stabilization is needed to improve the characteristics of these materials. In this research, slow-setting emulsified asphalt and medium-curing cutback asphalt were used to stabilize both marl and dune sand. Lime and Portland cement (2% and 4%) were added to the stabilized soils to accelerate the curing process and to reduce stability loss due to water damage. It was found that the stabilizing agents improved both shear strength and resistance of the analyzed soils to water damage. It was observed that Portland cement was more effective than lime. © 1997 Elsevier Science Ltd.